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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/719,422	12/12/2000	Yoshihisa Furuta	Q 62228	7788

7590 04/24/2003

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EXAMINER	
MUSSER, BARBARA J	
ART UNIT	PAPER NUMBER
1733	11

DATE MAILED: 04/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/719,422	FURUTA ET AL.	
	Examiner	Art Unit	
	Barbara J. Musser	1733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 February 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 3 is rejected under 35 U.S.C. 102(b) as being anticipated by Hanneman et al.(U.S. Patent 5,436,061) as evidenced by High Performance Films.

Hanneman et al. discloses an adhesive tape made from Kapton with an adhesive which can have an adhesive strength as low as 9-12 gf/mm(Col. 9, ll. 13-22; Tables I, II, and IV) but does not specifically state the thermal shrinkage. High Performance Films discloses that Kapton has thermal shrinkage of 0.10% at 200C. Thus one in the art would understand the film of Hanneman et al. would have a shrinkage of less than 3%. This film is capable of being used in the method of claim 1. Applicant is only claiming the adhesive film and not its combination with the lead frame. Therefore the reference film need only be capable of use in claim 1, not intended for use in claim 1.

3. Claim 3 is rejected under 35 U.S.C. 102(b) as being anticipated by Sakumoto et al.

Sakumoto et al. discloses an adhesive tape for use with electrical components with a thermal shrinkage of less than 0.15% in the resin deposition temperature range.(Col. 7, ll. 56-59) The tape is attached to a lead frame used with semiconductors with are sealed with resin after the chips are mounted.(Col. 1, ll. 15-35) Although the tape is not

specifically disclosed as pressure sensitive, the tape is applied without the use of heat, but simply via attachment.(Col. 11, ll. 17-19) One in the art would understand that this means the tape is applied via pressure. The reference also discloses the tape has an adhesive strength of not less than 267 gf/20mm.(Col. 5, ll. 25-27) Therefore the reference discloses adhesive strengths of 267 gf/20mm. This film is capable of being used in the method of claim 1. Applicant is only claiming the adhesive film and not its combination with the lead frame. Therefore the reference film need only be capable of use in claim 1, not intended for use in claim 1.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mostafazadeh et al.(U.S Patent 5,894,108).

Mostafazadeh et al. discloses adhering an adhesive tape to a lead frame having a chip mounted therein, encapsulating the chip and connectors with molding resin, and stripping the tape away.(Figures 5-7; Col. 1, ll. 63- Col. 2, ll. 19) The reference is silent as to the specifics of the adhesive tape. However, since materials are intended to be bonded directly to the base of the chip, one in the art practicing the invention would understand that the adhesive strength would be low enough that the tape could be

removed without adhesive residue remaining on the chip since that would cause problems in bonding. Additionally, problems with differences in thermal shrinkage of materials on resin encapsulation are well-known in the art. One in the art would be expected to choose an adhesive with low shrinkage or expansion to prevent the well-known problems of lead breakage on encapsulation. While the reference does not disclose the specifics of the thermal shrinkage and adhesive strength of the tape, one in the art would appreciate that low adhesive strength and low shrinkage would be required for the reasons disclosed above and would known how to pick the adhesive and substrate accordingly.

6. Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mostafazadeh et al. in view of Lin et al.(U.S. Patent 5,273,938) and as evidenced by High Performance Films.

Mostafazadeh et al. discloses adhering an adhesive tape to a lead frame having a chip mounted therein, encapsulating the chip and connectors with molding resin, and stripping the tape away.(Figures 5-7; Col. 1, ll. 63- Col. 2, ll. 19) The reference does not disclose the specifics of the adhesive tape but does disclose the tape can be polyimide.(Col. 3, ll. 46). Lin et al. discloses a method of forming chips which are attached to traces and encapsulated wherein the chips and traces are applied to a Kapton film.(Col. 2, ll. 64- Col. 3, ll. 2) It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a Kapton film as the basis for the adhesive tape in Mostafazadeh et al. since Lin et al. discloses Kapton film is a well-known film in this art and since Mostafazadeh et al. discloses that any polyimide film

can be used.(Col. 3, ll. 46) Neither reference discloses the thermal shrinkage of the tape. High Performance Films discloses that Kapton has thermal shrinkage of 0.10% at 200C. Thus one in the art would understand the film of Lin et al. in the process of Mostafazadeh et al. would have a shrinkage of less than 3%.

While Mostafazadeh et al. does not specifically disclose using a mold to form the resin encapsulated chips, the reference does disclose that a molded plastic casing is formed over the chip.(Col. 2, ll. 13-14) One in the art would understand that a molded casing was made using a mold.

7. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mostafazadeh et al. in view of Lin et al. and High Performance Films as applied to claim 1 above, and further in view of Oida et al.(WO 98/35382) U.S. Patent 6,291,274 is considered an English language translation and all column and line numbers refer to it.

The references cited above do not disclose replacing the lead frame of Mostafazadeh et al. with a tape carrier. Oida et al. discloses tape carriers can be used in place of lead frames when encapsulating chips in resin.(Col. 10, ll. 39-45) It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the lead frame of Mostafazadeh et al. with a tape carrier since such is well-known and conventional in the art as shown for example by Oida et al.(Col. 10, ll. 39-45)

8. Claims 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mostafazadeh et al. in view of Lin et al. and High Performance Films as applied to claims 1 and 4 above and further in view of Nakayama et al.(U.S. Patent 5,538,771)

Neither reference discloses the type of adhesive used. Nakayama et al. an adhesive used as backing in the formation of chips which is then stripped off. The adhesive has a low adhesive strength since the chips must be removed from the tape after formation. Its strength is greater than 120 gf/25 mm before UV irradiation and less than 30gf/25 mm after irradiation.(Col. 10, ll. 29-33) It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the adhesive of Nakayama et al. on the film of Lin et al. in the process of Mostafazadeh et al. since the adhesive can hold chips and is weak enough that it can be removed without leaving adhesive residue, which is important since the chips bottoms can be bonded to other materials and particularly since the adhesive is known in the electronic arts.

Response to Arguments

9. Applicant's arguments filed 2/12/03 have been fully considered but they are not persuasive.

Regarding applicant's argument that the adhesive tape of Sakumoto et al. is intended for fixing lead frames, not for masking during resin encapsulating, claim 3 only requires the adhesive tape can be used for resin encapsulation. The tape of Sakumoto et al. has all the properties required by the claim and therefore can be used in the process of claim 1. Applicant is reminded that since only the tape is claimed, the language "can be used for" is only suggested use and does not further limit the claim.

10. Applicant's arguments with respect to claims 1 and 2 have been considered but are moot in view of the new ground(s) of rejection.

Mostafazadeh et al. discloses the method claimed by applicant but does not disclose the specifics of the tape, which considering that the problem of thermal shrinkage of different materials on resin encapsulation is well-known in the art, would have been obvious.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Barbara J. Musser** whose telephone number is **(703)-305-1352**. The examiner can normally be reached on Monday-Thursday; alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Ball can be reached on 703-308-2058. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Michael W. Ball
Supervisory Patent Examiner
Technology Center 1700

BJM
April 18, 2003